v. 12 #8

# The MONTHLY REVIEW

Published Monthly by the

American Electroplaters Society

E. J. MUSICK
President
Courtesy METAL INDUSTRY

**A SOCIETY FOR THE ADVANCEMENT OF THE SCIENCE OF ELECTROPLATING**

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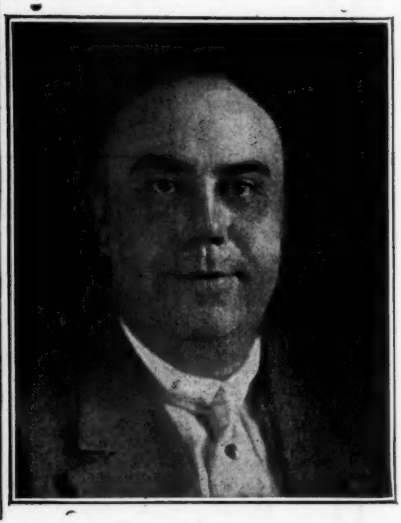

F. J. HANLON
Past President

# MONTHLY REVIEW

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American Electroplaters' Society

ONEIDA, NEW YORK

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## EDITORIAL

### A MESSAGE FROM THE EXECUTIVE BOARD

The new Supreme Officers for 1925-1926 take this opportunity to extend to you their greeting, and to ask your earnest and unselfish aid and co-operation in an endeavor to make this a banner year in the history of the A. E. S. for new members, and more education and loyalty to our society.

In the past years some of the Branches have deviated from the by-laws and Constitution precepts and in many instances this has caused annoyances to our Society; this we wish all officers and members to kindly assist us in overcoming by strict and conscientious obedience to the By-Laws and Constitution as written and accepted by us to guide our destiny until experience has caused us to make changes in these laws in a legal way. We further urge you to attend your Branch meetings regularly, so that we may by closer personal contact promote the feeling of confidence and loyalty to each other, so that at our next annual meeting in Newark, we of the Supreme body may say to you members, "You have stood by us loyally and we have served you well and let peace and harmony prevail to our success."

We also feel that during the ensuing year we will see many new and interesting plating problems investigated through the Bureau of Standards at Washington, D. C., that will make us feel proud that we are able to send a large Research Committee to the Bureau to confer with Dr. Blum

and his assistants and to give them suggestions that they may be able to get us more information so necessary to our boys in this era of commercialism.

We further assure you that with your loyalty to these requests that you may expect an excellent A. E. S. year and an administration that will make you proud of having been a contributor to, and it will be a lot of pleasure to your past officers who have labored so hard and conscientiously to bring this Society to its present high plane of efficiency.

Thanking you all in advance for your every assistance in complying with the aforesaid, we are

Very truy yours,

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**CORRECTION**

Paper by Proctor & Sizelove, July REVIEW, 1925, page 17, 23d line, should read 5 grains instead of 5 grams. Mr. Proctor makes this correction.

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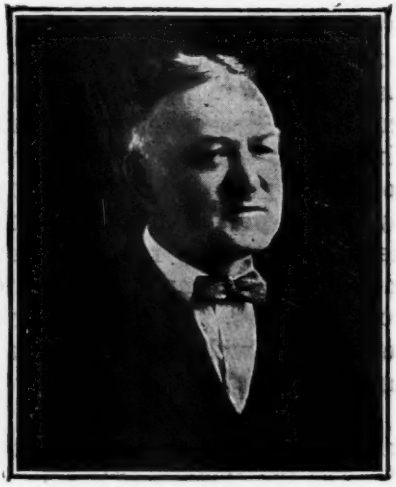
GEORGE GEHLING
1st Vice President



JOHN H. FEELEY
2nd Vice President
Courtesy METAL INDUSTRY

## PLATING OF SODA FOUNTAIN FITTINGS

By John Young

Foreman Plating Dept., Fletcher Mfg. Co., Ltd.. Toronto.

Having been requested by the Secretary of the Toronto Branch to present a paper on the above subject and feeling that I have nothing new to offer in regard to the electro deposition of Silver, I will therefore confine my paper to the method by which I prepare and silver plate our products which are made from Nickel Silver, Bronze, Brass, Britannia Metal and Block Tin.

**Nickel Silver Draught Arms:—**

The work first comes from the Polishing and Buffing Department in a fairly clean state and is readily cleaned in one of the well-known cleaning solutions which removes any buffiing compound, grease or other foreign matter. I then rinse the work in clean running water, after which it is placed in bran water, from which it is removed and scratch-brushed with No. O pumice stone. The work is then rinsed and sponged in clean running water and passed through the silver strike. From the strike it is taken and again scratch-brushed, then run through the silver strike a second time, after which it is placed in the regular silver-plating bath for one hour. I then remove it and scratch brush it again and return it to the regular silver-plating bath, in which it remains continuously for four hours longer —making a total of five hours deposit. After this the work is ready for burnishing and rouge buffing.

**Syrup Pumps:—(made of Nickel Silver, Bronze and Block Tin)**

These articles require a good deposit in the recesses as well as on the high parts. It is therefore necessary that the silverplating soltuion contain a higher percentage of free syanide to improve the throwing properties of the bath, the method of preparing and treating the work being the same as mentioned in the previous paragraph.

**Sundae Cups:—**

These are made of Nickel Silver and are heavily silver plated, being finished in the aforementioned manner.

**Soda Holders:—**

These are made of Britannia Metal and after buffing are passed through the cleaning process previously mentioned; then through the silver strike and finally given a good deposit in the regular silver plating bath.

**Dishers:—**

These are made of brass and nickel plated, and after being treated to the same cleaning process are put in the nickel bath and given a heavy deposit of nickl, then buffed to a bright finish.

The foregoing part of my paper deals with my method of handling our work and offers nothing out of the ordinary, and as to my soltuions I have nothing new to offer.

The Silver strike is the ordinary strike—low in metal and rich in cyanide.

The Silver Bath contains approximately 3 ounces metallic silver and approximately 4 ounces free cyanide to a gallon . In the silver bath for plating deep recesses the metallic contents is approximately 3 ounces per gallon and the free cyanide approximately 6 ounces per gallon.

In my twenty years' erperience as Foreman Plater I have given my greatest attention to the process of cleaning and preparing work for plating, which is the formost essential but which has to be backed up by solutions that are kept up to a standard at all times and provided with the largest possible annode surfaces. By always paying closest attention to these details the most successful results have been obtainable.

In the Toronto Branch the majority of our members have a fair knowledge of electro-chemistry through their membership in the Electro Platers' Class at the Technical School and therefore are qualified to analyze their solutions and keep them up to a standard that will insure the best results, which indicates much has been accomplished through the educational features of our Society, and as a humble member having nothing new to offer, I claim that what success I have obtained is due to my consistency in cleaning methods and the proper control and standardization of my solutions.

## ACID TREATMENT OF CARBURIZED STEELS

By Walter S. Barrows, Toronto Branch

We believe it is universally conceded to be necessary, or at least wise, to give iron or steel an immersion in some type of acid solution immediately before placing the iron or steel in a nickel plating bath, unless the iron or steel has been previously coated with copper, brass or other metal, and even then many platers use the muriatic acid solution to acidulate the surface or remove oxides. This paper is a compilation of opinions, and has been prepared for the purpose of helping those who by reason of very limited experience with carburized steels, have difficulty when plating them, also for the purpose of arousing a discussion respecting the relative value of the various acids for treatment of carburized steel surfaces immediately prior to electroplating. As you all know there are different forms of iron, each characterized by one or more distinctive properties. Steel possesses several valuable properties which do not belong to either cast or wrought iron. It is harder, denser and whiter in color. It is also more elastic, takes a higher polish and rusts less easily. Its most characteristic property consists in its admitting of being tempered at will to any degree of hardness. Grey Irion has its carbon partly in the chemically combined but chiefly in the uncombined or graphitic state. This is very apparent when a polished piece of Grey iron is transfered from a hot alkaline cleaning solution to a warm dilute solution of sulphuric acid and water. A momentary immersion in the acid solution will cause free graphitic material to appear on the surface of the grey iron to such an extent that its removal by friction is necessary before the iron may be safely subjected to the action of the plating bath. Cast iron may contain from 2 to 5 per cent of carbon, while the maximum in steel is about 2 per cent, but steel is practically free from Silicon, Sulphur and Phosphorus while cast iron is not. Carbon affects the color, strength, hardness and fusibility of cast iron. It exists in pig iron in two distinct forms, the combined, and graphitic or free carbon, and upon the relative proportions of each in a great measure depends the character of the metal. The "total carbon" is always equal to the combined plus the graphitic. Graph-

itic carbon occurs almost exclusively in grey pig iron (foundry iron) in the form of dark thin flakes varying much in size and intersecting the same particles of iron. Its influence is to make iron softer and tougher, but weaker and less tenacious than if existed in the form of combined carbon. Carbon combines with iron up to about 4.63 per cent, and the amount that will be taken up is dependant chiefly upon the percentage of silicon, sulphur and manganese present. Silicon and sulphur lowing the amount of carbon, while manganese raises the point of saturation. Phosporus does not seem to have any effect upon the carbon." Experimenters have shown that the strength of cast iron depends upon, first,—the amount of weakening impurities present, and second,—the proportion existing between the combined and uncombined carbon in the iron. "Cast iron when free from manganese, can not hold more than 4.50 per cent of carbon, and 3.50 per cent is about as much as is ever present, but as manganese increases carbon increases also, until in Spiegel it is ofund as high as 6 per cent. (Spiegel is a peculiar kind of cast iron made from specular iron ore or Hematite). This effect or capacity to hold carbon is peculiar to manganese. Castings of iron alone or of iron and carbon will always be white, and the carbon will always be combined. The greyness of cast iron depends upon the percentage of silicon present."

Wrought iron differs from cast iron in being almost free from carbon. Steel differs from soft iron in containing a varying proportion of carbon, usually from .5 per cent to 1.8 per cent. When rich in carbon steel closely resembles cast iron in composition, except that it is more free from impurities. Cast steel is regarded as high quality steel, it is finely granular, homogeneous, dense and well adapted for the finest kind of edged tools and industrial products. In addition to the ordinary steels there are several steel alloys such as Chromium Steel, Vanadium Steel, Nickel Steel, Tungsten Steel and Chrome Nickel Steel, also a host of steels of varying composition, called stainless steel. Some of these steels the plater is required to either elctro-plate or acid treat for some reason and each may present its own problem.

## Tempered Versus Carbonizd Steel

The difference between tempered and untempered steel is due to a difference in the molicular arraingment produced by tempering. Tempering draws carbon to the surface. Carbonizing adds carbon to the steel and causes a finer grain, less porous and the carbon is less easily liberated. Steel thoroughly carbonized has a dull white frosted looking surface. If the surface is mottled it may be hard, but not as hard as it is possible to make it. Carbonizing by the cyanide method the depth of conversion is about 1/64 inch. Carbonizing by the box method for long period of time the depth of conversion is 1/16 to 1/8 inch.

Strong Sulphuric acid is seldom used as a dip as it has comparatively little effect upon hardened steel except at a high temperature. Dilute Sulphuric acid is not as commonly used as is Hydrochloric acid, yet the latter actually attacks the metal less than the former and unless the steel is actually roughened to a slight extent, the surface condition is not conducive to adherent deposits. Practically all muriatic dips are employed cold, while a sulphuric acid dip to be highly effective should be used warm or quite hot.

The accumulation of ferrous sulphate in a sulphuric acid dip indicates it is time to make a fresh dip. The writer uses a variety of acid dips for steels. Possibly the more interesting is one consisting of undiluted hot sulphuric acid. The range of temperatures at which this dip is used vary from 120° Fah'r to 140° Fah'r . Duration of inmersion of steel in this dip varies from 15 seconds to 35 seconds. No soft steel is allowed to be treated in the dip. When tempered steel is immersed in a dip of this nature the surface carbon is very quickly uncovered and the surface of the steel acquires a very dark, almost black appearance. If the immersion is correctly timed the action of this acid is only sufficient to produce a surface upon which a nickel deposit may be obtained from almost any type of nickel solution, and which will adhere most tenaciously under any form of test it is possible to subject the article to. If, however the immersion is prolonged even a few seconds, the graphitic coating upon the steel will cause the surface to be so rough that a deposit of nickel subsequently obtained up-

on this surface will be exceedingly difficult to color, but not necessarily non adherent or otherwise defective. We contend that a nickel deposit upon a highly polished carburized steel surface, which has been properly cleaned and subsequently subjected to an immersion in undiluted sulphuric acid at a temperature within the range of 110° to 120° Fah'r, and of a Beaume density not less than 49°, for the proper period of time, (time depending on carbon content of steel or nature of the alloy) will be equally as adherent, and probably more adherent than a nickel deposit from the same bath upon a highly polished carburized steel surface, which has been properly cleaned and treated in a muriatic acid solution of any concentration, at any practical temperature for the same period of time.

We have yet to learn of any injury to carburized steel where the thickness of the steel was at least three times th depth of conversion. For extremely thin products, such as flangers or bearing retainer rims, we would not advocate any attempt at making rapid treatment. Slower action is undoubtedly the wiser plan.

We may term an acid solution used for the purpose of roughening steel or other metal prior to transfer of the metal to a plating bath, a "Bite." A "bite" consisting of undiluted sulphuric acid is more easily controlled than a "bite" consisting of the dilute acid. Acids in general lose their hydrogen when in contact with metals and form salts. One authority claims that for every 500 sq. feet of steel surface pickled with $H_2SO_4$ about 60 pounds of metal are wasted by conversion into ferrous sulphate.

We are informed that dilute pickling solutions can now be controlled to such an extent that practically no metal is lost. In the treatment of polished carburized steel surfaces prior to plating the object is unlike that of pickling and we are not convinced that a method of control proving satisfactory in ordinary pickling may necessarily prove satisfactory when applied to the "bite." High carbon steels like cast iron become coated with a gummy deposit if treated to excess, the film of graphic carbon is not easily removed.

Laughbein tells us that "objects of iron or steel are

momentarily plunged into a mixture of $H_2SO_4$—1 part and water, 20 parts, and then quickly rinsed." In our opinion such an operation merely changes the liquid coating on the surface of the metal from a possible alkaline solution to a weak acidulated solution, no appreciable effect on the steel having been possible. Laugbeims method may possibly suffice for some kinds of soft iron and soft steel when the surface has been thoroughly cleaned by some frictional treatment, otherwise we consider the success attending its use wholly dependant upon factors totally foreign to the preliminary acid treatment of the steel.

Mr. J. H. Hausjoster once recommended a pickle composed of H.F—1 part, $H_2SO_4$—4 parts, water 5 parts. On page 317 of September 1911 issue of the Brass World, Mr. James Hughes of Gardner, Mass., advises the use of "10 to 15 parts of water and 1 part HF for preparation of steel prior to plating in a nickel solution." It will be observed that Mr. Hansjosten's pickle contained the same proportion of HF per gallon as Mr. Hughes dep. plus 4 parts of $H_2SO_4$, but only 1/2 to 1/3 the amount of water. The pickel being the stronger solution, which is rather unusual in commercial practice. In fact our researches have revealed comparatively few reference where $H_2SO_4$ is even suggested for treatment of steel prior to plating, preference almost invariably being given to muriatic acid. But the acid strength of the average "bite" is not sufficient to effect even the slightest roughening of hard steel surfaces, if employed at room temperature.

Mr. Hughes solution as just given is not adapted for use on hardened springs or similiar articles . Mr. John Coulson, Physical Chemist of the research laboratory of the Westinghouse Co., East Pittsburg, Pa., in 1917, stated that "Hydrogen is absorbed rapidly by iron or steel when pickled either chemically, or electrolytically as cathode, in acid solutions. * * * * * Iron and steel may be cleaned effectively and quickly by pickling electrolytically as anode, without impairing their strength, resiliency or other physical properties. The greater brittleness of chemically and cathodically cleaned steels is more marked with the high carbon steels, and less marked with the soft steels." In

1917, Mr. Fuller of the research laboratories of the General Electric Co., Schenectady, N. Y., stated that the embrittlement of steel springs in the plating bath could be prevented by first dipping the springs into a bath of molten tin, the tin forming a coating on the steel which is impermeable to atomic hydrogen.

Some platers contend that the use of sulphuric acid as a "bite" prior to nickel plating, has a tendency to impregnate the steel or iron with sulphates. For the purpose of comparison let us assume that such is actually the case. Are we to believe that a less harmful inpregnation of the steel results from the use of Hydrochloride acid? Personally we prefer to take sides with the sulphuric acid. Rust results more easily and more rapidly in the vicinity of hydrochloric, than in the vicinity of sulphuric acid. It is more difficult to check or to prevent serious corrosion of exposed steel surfaces subjected to continuous attack of fumes from hydrochloric acid than is the case when steel is exposed to sulphuric acid fumes.

We have heard platers of considerable experience in plating practice ridicule the idea of using sulphuric acid as a "bite" prior to plating because they knew it was "too oily." "Not practical to use an oily acid," for the purpose. The writer has used sulphuric acid "bites" in some form or other for thirty years and expects to continue doing so unless someone can prove he has something better and I don't think it will be hydrochloric acid.

Reviewing my experiences with acid "bites" or acid solutions used for treatment of steel surfaces prior to electro-plating with nickel, I may briefly summarize the outstanding features of he respective acid solutions as follows:

Sulphuric Acid—Pickle—Action is more or less mechanical.

Sulphuric Acid—Bite— Action is wholly chemical.

Hydrochloric Acid—Bite—Less energetic than Sulphuric acid.

Hydrochloric Acid—Bite—Retains a given density for shorter period than sulphuric acid.

Hydrochloric Acid—Bite—Becomes ineffective on polished carburized steel surfaces quicker than sulphuric acid.

Hydrochloric Acid—Pickle of high concentration is less effective than a dilute solution.

HC'L or $H_2SO_4$—Are more effective as either a pickle or a bite when used at higher temperature than room temperature.

The residue, or products of the reaction accumulate more rapidly in a $H_2SO_4$ bite than in a $H_1CL$ bite.

First evidence of Ferrous sulphate at or near surface of $AH_2SO_4$ bite should be last call for new solution. For speedy action and check on uniform hardness of the treated steel, the $H_2SO_4$ bite is both effective and reliable.

Absorption of moisture from the air is quite noticeable with $H_2SO_4$ bite of high concentration.

Equal quantities of HCL and $H_2SO_4$ make a more effective bite for some high carbon steels than either HCL or $H_2SO_4$ employed seperately.

The successful use of these concentrated acid solutions as "bites" for carburized or tempered steels must be attended with some study and care on the part of the operator or disastrous results will follow. The "bite" plays a very important part in the general scheme of electro-plating and should be carefully adapted to the metals or the conditions of metal to be treated. For this reason the plater should understand the nature of the metal he is required to electro-plate, and the condition of the metal with reference to carbon content, temper, etc. A study of the metals, the signifigance of the carbon content, the effect of different acids, and different concentrations of acids, at different temperatures, will be found to be a remarkably pleasing, and instructive undertaking.

There are many phases of the story which we have not incorporated in this weak attempt to present the subject for your consideration. The treatment of non-ferrous metals has purpisely been omitted as that would necessitate covering a seperate field of pickling and acid dipping.

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We wish to acknowledge our indebtedness to Messrs. R. Andrew, L. Bryson and A. Bennett o fthe C. C. & M. staff for encouragement and many liberal advices and points of information during our tests and experiments.

## SHEFFIELD PLATE

In 1742 a workman named John Bolsover, was mending the handle of a knife made of silver and copper, when, accidentally overheating it, he caused the two metals to fuse together.

As a consequence the silver adhered to the copper as a thin coating.

Being an intelligent man, he perceived the commercial value of his chance discovery, and began the manufacture of articles which with all the appearance of silver, were both cheaper and stronger than those made of pure silver.

To this new type of metal work, which proved not only ornamental, but also of practical domestic use, was given the name of "SHEFFIELD PLATE", although first manufactured in Birmingham. The name Sheffield was applied to this new type of metal because the process was first discovered, and ultimately brought to perfection in Sheffield.

Bolsover apparently however, confined himself to applying the Silver direct to the surface of the copper, after the later had been given the shape destined to it, and was thus limited to the production of small articles, such as snuff boxes, knife handles, toilet articles, etc.

It was reserved to Joseph Hancock to realize that by making the plate first, and working it into the desired shape afterwards, he could almost indefinitely extend the possibilities of the material. The process in its final and highest development was as follows:

The ground was made of an alloy of copper and brass, such that there were four parts of copper to one of zinc. This was found necessary owing to certain difficulties met with in the use of pure copper. The metal was cast into an oblong ingot one to one and a half inches in thickness, two and a half inches in breadth, and of a length regulated by the size of the plate desired. The surface was brought by planing, grinding, and other means to the highest possible pitch of smoothness, and evenness. A sheet of silver of a finer quality than standard, ranging in thickness from one sixteenth of an inch to nearly one inch, according to the quality aimed at was leveled and polished in the same

manner as the base metal. This sheet of silver was accurately fitted to the base metal, neither surface at any time being soiled by contact with the workman's fingers. A sheet of copper rather smaller than the other two, and one sixteenth of an inch in thickness was laid upon the silver, and on top of all was added a piece of iron one half an inch in thickness, one inch wide, and a little shorter than the other three, to protect them from the strong iron wire with which all were firmly held or bound together. The junction of the edges of the silver and copper was treated with a flux or borax, and the whole was submitted to the heat of a furnace until the silver was seen to be melting. Then it was instantly removed, care being taken to avoid pressing upon the upper or lower surfaces, as the liquid silver in that case would have been squeezed out from between the two enclosing plates, and the operation runied. It was then left to cool, and after being thoroughly cleansed, presented the appearance of a copper ingot with one silver side. This was passed several times through gradually approximated rollers with occasional annealing until the desired thickness had been attained. The great extension of the surface thus produced had the draw back of exaggerating any small defect in the union of the two metals, increasing it to a blister of an inch or more in diameter. It was however, fortunately found easy to remedy this. The blister was pricked, broken, and heated, and then rubbed level with a burnisher. If, as sometimes happened, the silver had flaked away, it was replaced by pure leaf silver rubbed in with a burnisher.

The plate if then passed as flawless, was cut into the desired form, and moulded as far as possible into shape. The edges where necessary being soldered.

At first only one surface of the copper was plated with silver, and thus its usefulness was necessarily restricted. but it was a simple matter to apply the silver to both sides, and whatever was made in solid silver or metal could be reproduced in plate. Firm after firm went into the business, introducing further improvements. The possibility of embossing the metal beyond a certain point without fracturing the coating of silver, was got over by coating or stamping the raised orament in silver, and filling the hol-

lows with a form of pewter, and soldering the result to the appropriate part of the general design. Another difficulty, the concealment of the inner case of copper which was seen as a thin red line when a cut edge was exposed, was met about 1784 by George Cadman, who adopted the practise of soldering on an edging, generally ornamented, of silver, so as to cover the junction, and the presence of this is one of the trustworthy tests by which genuine Sheffield Plate may be recognized. The labour of rolling the metal by hand was done away with about 1760 by the firm of Tudor, Leader and Sherburne, who first employed machine power, and for more than half a century, the trade, both in Sheffield and Birmingham continued to improve its methods and expand.

The manufacture of Sheffield Plate grew to such an extent that, whereas in 1736 the population of the city was a little less than 10,000 inhabitants, in 1760 it reached 22,000.

The success was however, doomed to be short lived, and came to and end as swiftly as it had grown up.

In the year 1820, W. Cruickshank was already experimenting with a process of electroplating, and in 1837 Mr. Spencer in England and in 1838 Professor M. H. Jacobi in Russia, working independently succeeded in contriving methods which could be made commercially profitable. Two years later Messrs. Elkington in London and M. De-Rualz of Paris started in business on those lines, and the slower and consequently more costly manufacture at Sheffield and Birmingham rapidly died out.

Of recent years old Sheffield Plate, after long neglect has come into fashion again, and genuine articles in good condition have greatly increased in value, often exceeding in cost those of more modern date in sterling silver.

Owing to the enchanced value of genuine Sheffield Plate during recent years, imitations of it have become more frequent. In some cases the whole object is a modern reproduction in electro plate, but more often, really old articles from which the old plating is worn off in course of time have been replated, both equally being in the eyes of the connoisseur, equally unworthy of serious attention, and comparatively valueless. The difference after a little

experience is not difficult to detect through unexpressible in words.

The pressure to which Sheffield Plate was submitted produced a different colour and texture which is absent from the surface produced by the deposit of silver. This deposit of silver is speard uniformly over the whole surface without a break, while in the former the junction between the embossed ornaments and the silver strips covering the cut edges may often be detected on careful examination.

It is of interest to note that there are two distinct periods marking the manufacture of Sheffield Plate. The first which might usefully be called The Copper Mount Period, extending from the time of discovery down to about 1790. The second or Silver Mount Period from 1790 until the close of the manufacture about 1840.

The most interesting pieces are those of the earliest manufacture until about 1770. The numerous faults can easily be forgiven when considering the difficulties under which the early manufacturers must have worked, which were gradually and steadily overcome.

Between 1770 and 1780 saw the finest specimens of Sheffield Plate produced. Their chief characteristic being their prettiness and simplicity. It is noteworthy that the craftsman practised the greatest economy as to the metal used, and that he steadily kept in view the utility of the article, it had to be made useful. Oramenttation was added as an afterthought.

During the first period the base metal was always copper, the bodies at different articles were raised without seam, on horse, sandbag, or bellowing stake. Soft solder was only used when the surface was large in proportion to the work. Hard solder being used only for seams where articles could be rehardened with not much danger to design and silvercovering. The final touch was to slightly polish by hand with rouge to get the subdued colour which so beautifully shows the charming outline and minute detail of the article. Parts of candlesticks, an important article of that day, were at first roughly made by dies, and finished by hand . Articles for domestic use were tinned inside in order to prevent the copper from corroding. Dur-

ing the earliest period chasing was very little used, but embossing and fluting especially can often be found.

During the second period the base metal continued to a great extent to be copper. German Silver however was then introduced and marked a decided improvement, owing to its colour being less suspicious. No alteration in workmanship can be recorded with the exception of edges and mounts, which instead of as formerly being stamped out of copper were now stamped out of thin pieces of silver.

The more massive Gadroon edge coming into fashion was now applied in the same manner, then the Shell edge and finally the Florid edge.

Burnishing was also required to produce the bright mirror like appearance, people not being content with the beautiful subdued colour of the earlier period. Also the simple, though highly decorated and elegant designs of about 1770 fell rapidly into disuse, making more room for the more massive designs. The tendency for massiveness it is to be regretted was not correctly controlled, and soon the cry began for more florid, gaudy, heavy and showy designs. This appears to have continued until the end of Sheffield Plate.

R. STEUERNAGEL
Secretary-Treasurer

F. C. MESLE
Editor

Courtesy METAL INDUSTRY

## BRANCH NEWS

### Hartford-Connecticut Valley Branch

Hartford-Connecticut Valley Branch met on July 27th at the Hartford Engineers Club. Delegates to the Montreal Convention gave a detailed account of their trip to Canada.

The question of unpaid dues was brought up for discussion and the secretary was instructed to report members whose dues were in arrears at the next meeting.

Messrs. Kennedy, Clark and Roberts were appointed a committee to arrange a meeting in Springfield, Mass., on September 28th.

Mr. Kennedy than told of some of his experineces in plating cadimum on radio parts.

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### Toronto Branch

As is usually the case in Toronto Branch a large proportion of our members were victims of some bodily ailment or afflicted with sudden attack of forgetfulness on the evening of our July meeting. A goodly number responded however and heard the report of the delegates to the Montreal convention. Questions and discussion of the various papers and principal features of the convention followed the reading of the report.

Our next meeting will be held Monday evening, September 28th, in Room 2 at No. 22 College street. No meeting will be held during August. Action will be taken on all members who are in arrears of dues. The constitution does not permit us to defer action indefinitely. Memebrs who persist in ignoring statements of dues automaticly suspend themselves. So please do not consider yourself treated rough if your REVIEW does not arrive as usual.

The Technical School classes in elctro-plating opens early in October. Be prepared to enroll early and make this class a hummer.

A campaign to increase our membership will open in September, snd your request for application form early and make another soul happy.

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### New York Branch

The Second July meeting of the New York Branch, A. E. S., was held at the Regular Meeting Rooms, 509 World Building, N. Y. C.

The meeting was well attended, feature of which was Mr. Dupenell, Paper on Cromium Plating.

Lengthly discussion followed same paper by members, including Mr. Hogaboom of Newark Branch. Both gentlemen were given a rising vote of thanks.

### Newark Branch

The last two meetings of Newark Branch were well attended. The delegates brought back a very good report of the convention, which added to the interest of the meeting. Montreal met with the approval of all as a convention city. It is hoped that Newark will get the same indorsement a year hence.

While it is a little premature at this time to say anything about the next convention the first step was taken last meeting by appointing Horace Smih, chairman of the Convention Committee. Those who have attended the conventions, year after year, all know him for his jovial manner and an all around good fellow.

Now boys, sometime between now and the next convention he is going to call on the members of the A. E. S. for papers. Get all set, for this is a "preliminary tip" of what to expect and Horace is the boy who appreciates cooperation. He has never failed in any function he has under taken for Newark Branch and we stand behind him to a man.

Members will get busy to enroll for Chemistry Class at once. The Vocational School is at our service again. Don't lose this opportunity to better your conditions through the medium of Knowledge.

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### Dayton Branch

Instead of holding our regular meeting in July, the Dayton Branch gave a banquet at the Y. M. C. A. in honor of Mr. Walter Fraine for the winning of the Founders' Metal and Award for the best paper on electroplating.

Mr. E. Lamoureux of the Chicago Branch presented the Founders' Metal and Award to Mr. Fraine and congratulated the Dayton Branch on the honor brought to it by our Past President, Walter Fraine of the A. E. S.

The Branch held another surprise for Mr. Fraine, in which it presented Mr. Fraine with a gold signet ring, being presented by Mr. Hohman. The evening was then turned over to our President, Mr. Harter, who acted as chairman of the evening. We had as guests Mr. E. Lamoureux, Mr. R. J. Hazucha of the Chicago Branch and Mr. F. Nordman and Mr. William Husing of the Cincinnati Branch. Mr. T. J. Brunner of the Cincinnati Branch sent a telegram congratulating the Dayton Branch upon having received the Founders Metal and Award; also Mr. Fraine, and regret that he could not be present.

Mr. R. J. Hazucha of the Chicago Branch gave a very interesting talk on how the Chicago Branch were getting the manufacturers interested in the A. E. S., which everyone thought was a very good thing. Mr. F. Nordman and Mr. Husing gave a talk on the "Educational Program of the Cincinnati Branch.

Mr. Van Deran of Mansfield, who received the Founders' Metal and Award for Mr. Fraine, gave some very interesting facts on the P. H. value, and also a talk on baking enamel.

Everyone present expressed their feelings that they had a very enjoyable evening.

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### Detroit Branch

Detroit Branch held its regular meeting August 7 at Detroit Engineering Society Clubrooms, with President Cunningham in the chair. Our friend, Elmer W., having joined the "Knights of the Grip," left us minus a first-class secretary. After much political wire-pulling, which

would have done credit to a Tammany politician, the honor was forced upon George, much against his will.

Convention notes were rehearsed, and much interest is being taken in chromium plating, but it don't mean anything in our young lives, as we lack **The-Honest-to-Goodness Dope.**

If you haven't connected with the Patent Office and have real dope on chromium, perhaps you can spare some and help members of the Detroit Branch in need.

**All members of Detroit Branch take notice:**

(1) Look at your membership card.
(2) Are you paid up?
(3) If not, **Pay Quick**—or———
(4) Your REVIEW will be stopped.
(5) You will be suspended.
(6) You will not be eligible to attend our monthly meetings.
(7) You will fall behind the times.
(8) Your Branch cannot afford to pay your per capita tax to the A. E. S. and to the Detroit Engineering Society.
(9) Our expenses are too high.
(10) Pay up or take a chance on the empty dinner-pail.

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### Cleveland Branch

The Cleveland Branch met at the Hotel Winton. The meeting was a very interesting one. The discussion of the evening was "Bright and Rapid Nickel Plating" by various members. The report of the delegates to the Convention was very interesting and was well received. It was decided to hold our September meeting the second Saturday instead of the first Saturday. It was also decided to hold a picnic at Purity Springs Park, August 16. The secretary was instructed to congratulate the new Supreme Officers and assure them of our co-operation.

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### Chicago Branch

Regular meeting Chicago Branch held August 8, 1925.

Meeting called to order with President F. L. Greenwald presiding.

Mr. O. E. Servis drew up a ritual for the installation of new members; same was put to a motion and carried.

The educational program was very interesting. While there was no special subject, the way the boys went after the question looks as though the vacation days are over and are now getting down to hard work.

Question No. 1—What is a good stop-off paint that will not be affected by nitric acid?

Answer No. 1—Printers' ink and powder aspbaltuno and baked. Benzine mongol liquid, former acid resisting, was recommended. Eastman toping powder, electric etch.

Question No. 2—Any reason why silver should be harder to plate in hot weather than in cold?

Answer No. 2—No reason.

Question No. 3—How can silver be recovered from silver strip sheet to take up?

Answer No. 3—Add metalic zinc metal. P. Pt. silver with murattic acid.

Question No. 4—What process can be used to stop deep cups from rusting on inside?

Answer No. 4—A strong solution of whale oil soap and rinsed through hot water was recommended. Silicate of soda was also recommended.

Question No. 5—Strip for white gold; also formula for such a solution?

Answer No. 5—No formula given. Help: Acid strip was recommended, phosphoric acid, reversed current; use cold, and to 12 water 1 acid, agitated.

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### Bridgeport Branch

The regular August meeting of the Bridgeport Branch was held on the 7th, with a fair attendance. In the absence of President Belle, Past President Flaherty called the meeting to order.

After the regular business was dispensed with the Outing Committee gave a report on the proposed outing, stating that the outing is to be held on Saturday, September 19, at the Interdale, which is located on the road to Walnut Beach, Milford, Conn. The members agreed that the location was ideal, there being 25 acres of land, on which is a baseball diamond for the gang to enjoy themselves. The reputation of the management for well-cooked and well-served bakes is of the very highest.

### Platers, Attention!

Bridgeport Branch outing to be held at the Interdale on the road to Walnut Beach, Milford, Conn., September 19, 1925. Baseball game, athletic contests, shore dinner, dancing, etc. Twenty-five acres of land to enjoy yourself on. Ladies' Committee will see that the women visitors will be well entertained. For additional information address R. J. O'Connor, 1228 Noble Avenue, Bridgeport, Conn.

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### PLATER WANTED

The Star Plating Works, Memphis, Tenn., want a Plater . Those interested write direct to the above concern.

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### REINSTATED

#### Chicago Branch

Raymond Heingartner.....c|o Superior Plating Works, Fort Wayne, Ind.

#### Toronto Branch

Samuel Finlay .....79 Newmarket Avenue, Toronto, Canada

## ELECTED TO MEMBERSHIP

### Indianapolis Branch

Arthur W. Young ..... Hansell Apts., Kokomo, Ind.
Carl D. Cleaver ..... 520 Hendricks St., Anderson, Ind.

### Providence—Attleboro Branch

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## APPLICATIONS FOR MEMBERSHIP

### Chicago Branch

Nicholas P. Di Cesare ..... 427 Walker St., Chicago, Ill.

### Cleveland Branch

W. M. Schultz ..... c|o W. S. Tyler Co., Cleveland, Ohio

### Newark Branch

J. Donald Moulton, Associate
Edison Storage Battery Co., West Orange, N. J.
Wm. J. Taylor, Active ..... 11 Leo Place, Newark, N. J.

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## SUSPENDED

### Indianapolis Branch

H. C. Warner ..... 2424 E. 10th St., Indianapolis, Ind.
A. Boyd ..... 1043 S. Locke St., Kokomo, Ind.

### Providence—Attleboro Branch

Elijah Nickerson ..... 83 Homer St., Prov., R. I.
John Mederia ..... 55 Transit St., Prov., R. I.
Arthur Lewis ..... West Barrington, R. I.
Henry Lacasse ..... 258 So. Main St., Attleboro, Mass.
John Hufsmith ..... 56 Eudoro St., Prov., R. I.
E. W. Johnson ..... 14 Porch Drive, Riverside, R. I.

### Montreal Branch

Picton

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## RESIGNED

### Providence—Attleboro Branch

Mr. Carlton Hoyton ..... 269 Ohio Ave.

### Chicago Branch

Anton Chlosta ..... 1634 9th St., Sheboygan, Wis.

### Montreal Branch

Bauchamp

**BOSTON**

Regular meetings are held first Friday of each month, at 8 p. m., at the American House, Boston. Secretary, A. W. Garrett, 89 Alexander St., Dorchester, Mass.

**BRIDGEPORT**

Meets first and third Friday of each month at 62 Cannon St., Room 17, Bridgeport, Conn. Secretary R. J. O'Connor, 1128 Noble Ave., Bridgeport, Conn.

**CHICAGO**

Meets second Saturday of each month, at 8 p. m., Atlantic Hotel, 316 S. Clark St. Secretary, Robt. Meyers, 2210 Wilson Ave., Chicago, Ill.

**CINCINNATI**

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, W. J. Husing, 729 McMakin Ave., Cincinnati, Ohio.

**CLEVELAND**

Meets first Saturday of each month at Hotel Winton. Secretary, H. S. Kneeland, 3924 Clybourne Ave., Cleveland, Ohio.

**HARTFORD-CONN. VALLEY**

Meets on the fourth Monday of each month at 747 Main St., Hartford, Conn. Secretary, Tennant Elwin, 1145 Boulevard, West Hartford, Conn.

**DAYTON**

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Albert Bates, Box 34, Vandalia, Ohio.

**DETROIT**

Meets first Friday of each month at 478 Alexandrine West. Secretary, R. L. Shepard, 1388 Yorkshire Road, Fox Creek Sta., Detroit, Mich.

**GRAND RAPIDS**

Meets on the second Wednesday of each month at the Vocational High School, 129 Bostwick Ave., N. E. Secretary, John Raven, 1139 Emerald Ave., Grand Rapids, Mich.

**INDIANAPOLIS**

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

**MILWAUKEE**

Meets second and fourth Thursdays of each month at Lipps Hall, 321 3d St. Secretary, Roy Hunt, 4720 Lisbon Ave.

**MONTREAL**

Meets every Friday at 84 Craig St. West. Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

**NEWARK**

Meets first and third Fridays of each month at No. 17 Central Ave., Newark, N. J. at 8 p. m. Secretary, John Hiem, 25 Chestnut St., Newark, N. J.

**NEW YORK**

Meets every second and fourth Fridays of each month in the World Building, Park Row, New York City, N. Y. Secretary, J. E. Sterling, 468 Grand Ave., Long Island City, N. Y.

**PHILADELPHIA**

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

**PITTSBURGH**

Meets first Saturday of each month at 8 p. m., at United States Bureau of Mines Bldg., Forbes St. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

**PROVIDENCE-ATTLEBORO**

Meets first and third Thursday of each month at 184 Washington St., Room 308, Providence, R. I. Secretary, Robert Crook, 185 County St., Attleboro, Mass.

**READING**

Meets on the second Tuesday of each month. Secretary, William M. Fisher, 654 Gordon St., Reading Pa.

**ROCHESTER**

Meets every second and fourth Saturday of each month at the Powers Hotel. C. A. Reama, Secretary, 512 Lyell Ave., Rochester, N. Y.

**ST. LOUIS**

Meets first Tuesday of each month at Barr Branch Library, corner Jefferson and Lafayete Sts. Secretary, F. P. Menniges, 3205 A Arsenal St., St. Louis.

**TOLEDA**

Meets first Thursday of each month at Toledo University Science Building, Electro-Platers' Room, corner Cherry and Page Sts. Secretary, W. W. Weiker, 411 3d St., Toledo, Ohio.

**TORONTO**

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. Walter L. Barrows, 628 Dover Court Road, Toronto, Ontario, Canada.

**WATERBURY**

Meets every second and fourth Friday of each month. Secretary, Wm. F. Guilfoile, 230 Cooks St., Waterbury Conn.